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(54) Title: METHODS FOR SEPARATION AND DETECTION OF KETOSTEROIDS AND OTHER CARBONYL-CONTAINING COMPOUNDS

(57) **Abstract:** Methods for enhancing detection by mass spectroscopy (MS) and/or chromatographic separability of carbonyl-containing compounds such as steroids are disclosed. Reaction of a carbonyl compound with a sulfonylhydrazide compound provides a sulfonylhydrazone with enhanced ionization efficiency during the electrospray ionization process. In a particularly disclosed embodiment, derivatization of catechol estrogens with p-toluenesulfonylhydrazide enhances both detection by atmospheric pressure ionization-MS (API-MS), such as electron spray ionization-MS (ESI-MS) and separation by liquid chromatography (such as HPLC) under reverse phase conditions. In yet other embodiments, the sulfonylhydrazone is further reacted with a sulfonyl halide under alkaline conditions to derivatize hydroxyl groups in the compound. Prior formation of the sulfonylhydrazide derivative protects the carbonyl bond of the compound during subsequent alkaline reaction with the sulfonyl halide.